

AUTOMATIC LOADING OF PRIMING COMPOSITIONS

Presented jointly by
SNC TECHNOLOGIES INC
Montréal, Canada
and
New Lachaussée, S.A. / Belgium

Presented to
2001 Joint Services Small Arms
Symposium Sponsored by NDIA
August 13-16, 2001

Prepared by:
J. Pierre Drolet

Report Documentation Page		
Report Date 13Aug2001	Report Type N/A	Dates Covered (from... to) - -
Title and Subtitle Automatic Loading of Priming Compositions		Contract Number
		Grant Number
		Program Element Number
Author(s) Drolet, Pierre J		Project Number
		Task Number
		Work Unit Number
Performing Organization Name(s) and Address(es) SNC TECHNOLOGIES INC Montréal, Canada		Performing Organization Report Number
Sponsoring/Monitoring Agency Name(s) and Address(es) NDIA (National Defense Industrial Association) 211 Wilson Blvd, STE. 400 Arlington, VA 22201-3061		Sponsor/Monitor's Acronym(s)
		Sponsor/Monitor's Report Number(s)
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes Proceedings from the 2001 Joint Services Small Arms Symposium, Exhibition & Firing Demonstration 13-16 August 2001 Sponsored by NDIA, The original document contains color images.		
Abstract		
Subject Terms		
Report Classification unclassified		Classification of this page unclassified
Classification of Abstract unclassified		Limitation of Abstract UU
Number of Pages 11		

AUTOMATIC LOADING OF PRIMING COMPOSITIONS

➤ **Background**

- Small arms ammunition are produced on high production rates equipment
- Loading of priming composition into primer cups continue to be done manually (100 years)
- Workers are exposed to high explosive hazards for primer filling; primers quality depends on human skills

➤ **Objectives**

- To eliminate human exposures to explosive compositions
- To increase quality (better consistency: pressure, velocity)
- To meet NATO criteria

➤ **HOW can the Objectives be achieved?**

- By transforming the water-wetted sand (not free flowing) into an extrudable free flowing paste.

AUTOMATIC LOADING OF PRIMING COMPOSITIONS

➤ **Applications**

- Conventional lead styphnate based priming compositions
- Non toxic priming compositions
- Caliber .38, 0.40, 0.45 ACP, 9mm, 5.56mm, 7.62mm, 0.50 caliber

➤ **Challenges**

- To control the VARIATIONS of the PRIMING CHARGE WEIGHT over a long period of loading time (8h/min)
- For experimental purposes, to develop an inert mix with the same flowability as the explosive mix.
- To assure acceptable shelf life, etc .

➤ **Partnership**

- SNC TEC for the chemical formulation(s)
- NEW Lachaussée SA for prototyping and industrial equipment

Fig. 1 Influence of shelf life before loading on sensitivity

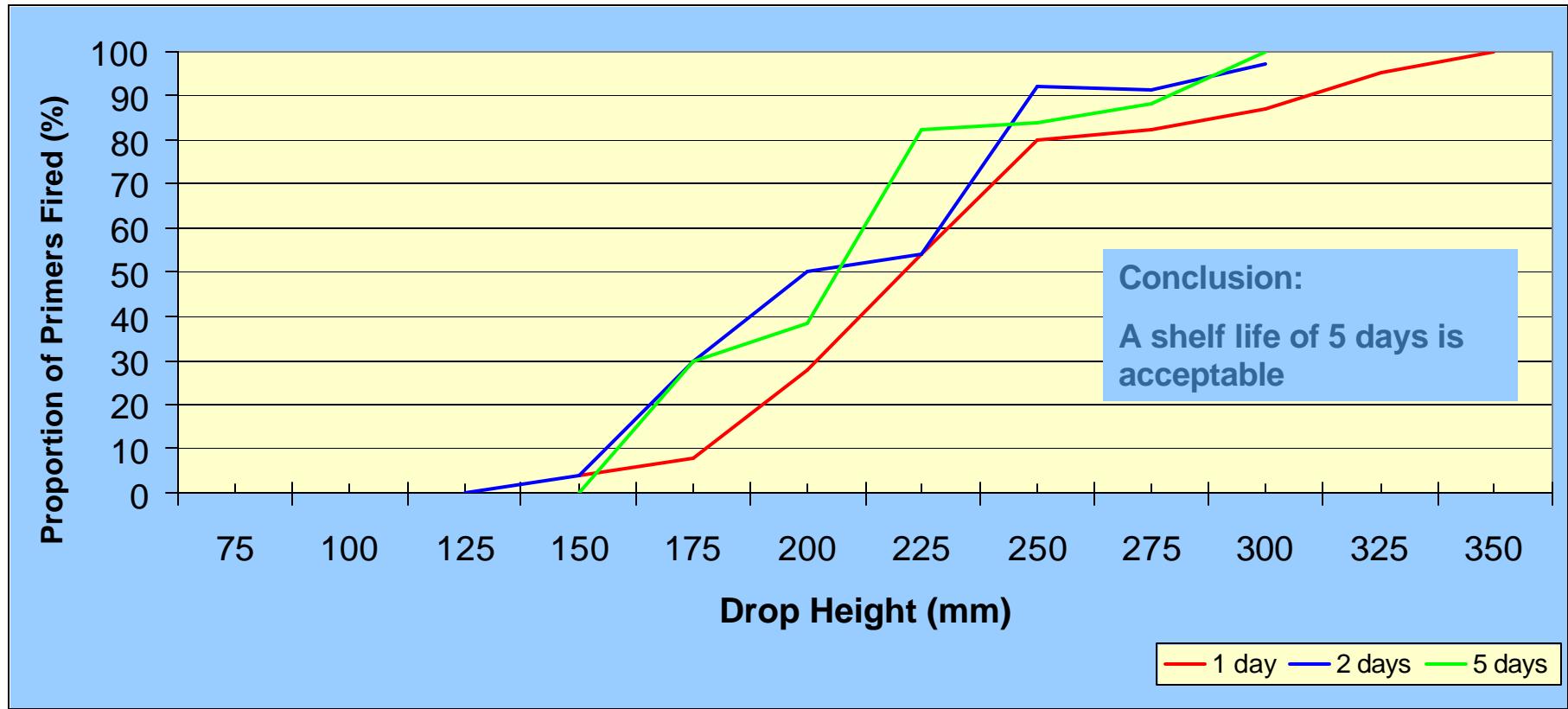


Fig. 2 - Influence of the compacting pressure on sensitivity

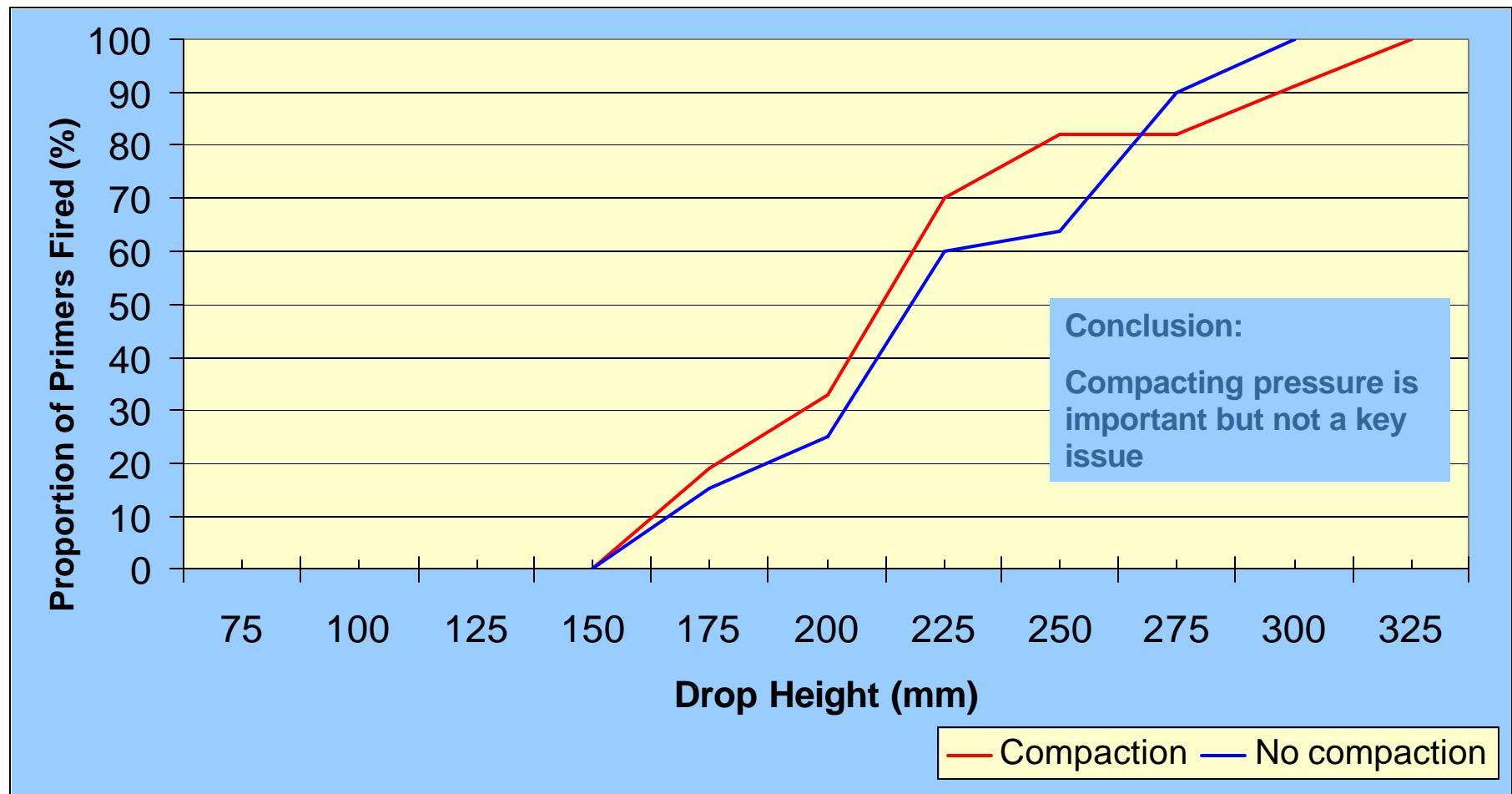


Fig. 3 - Influence of drying time on sensitivity

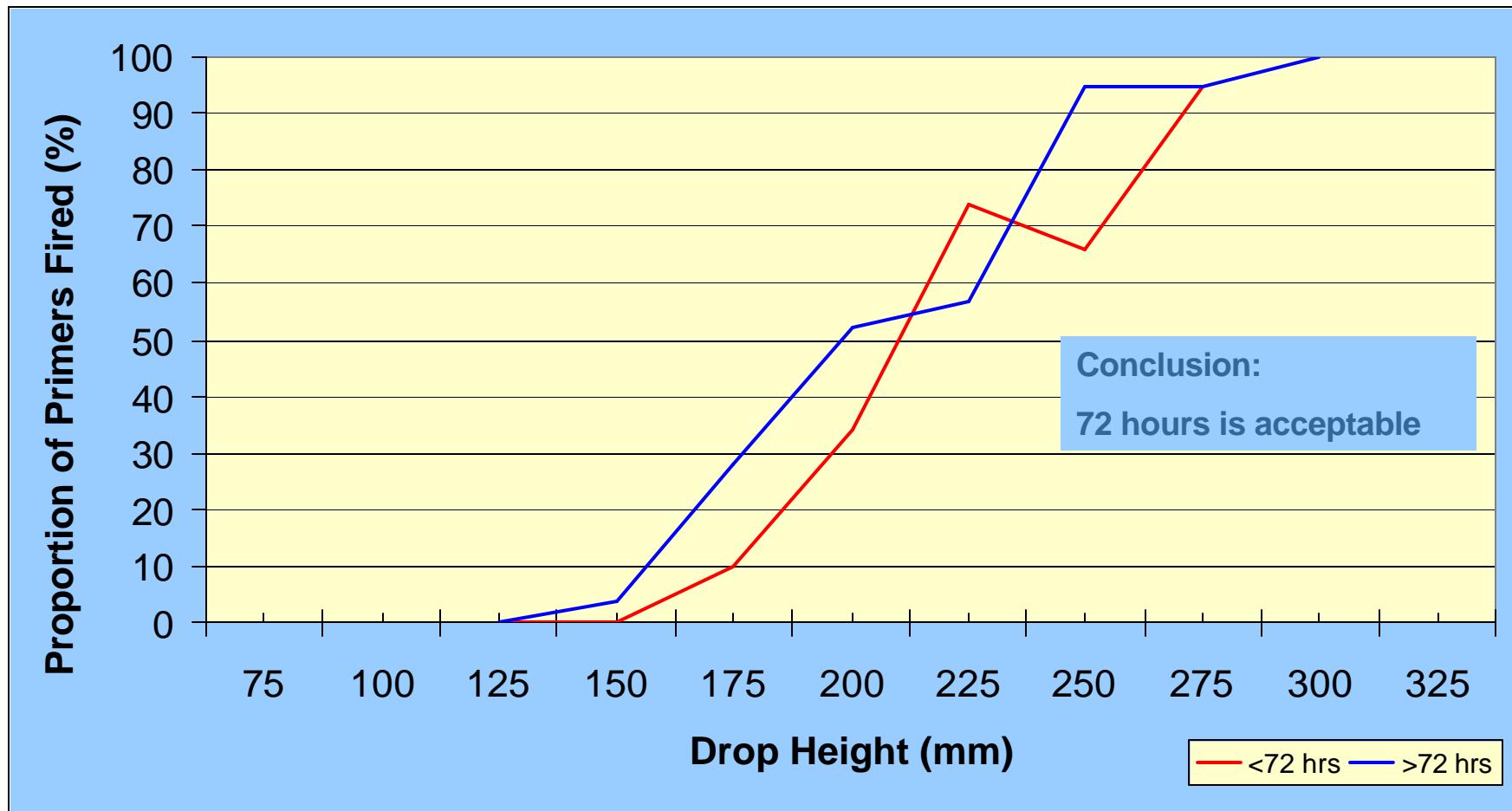


Fig. 4 - Influence of temperature variations on sensitivity

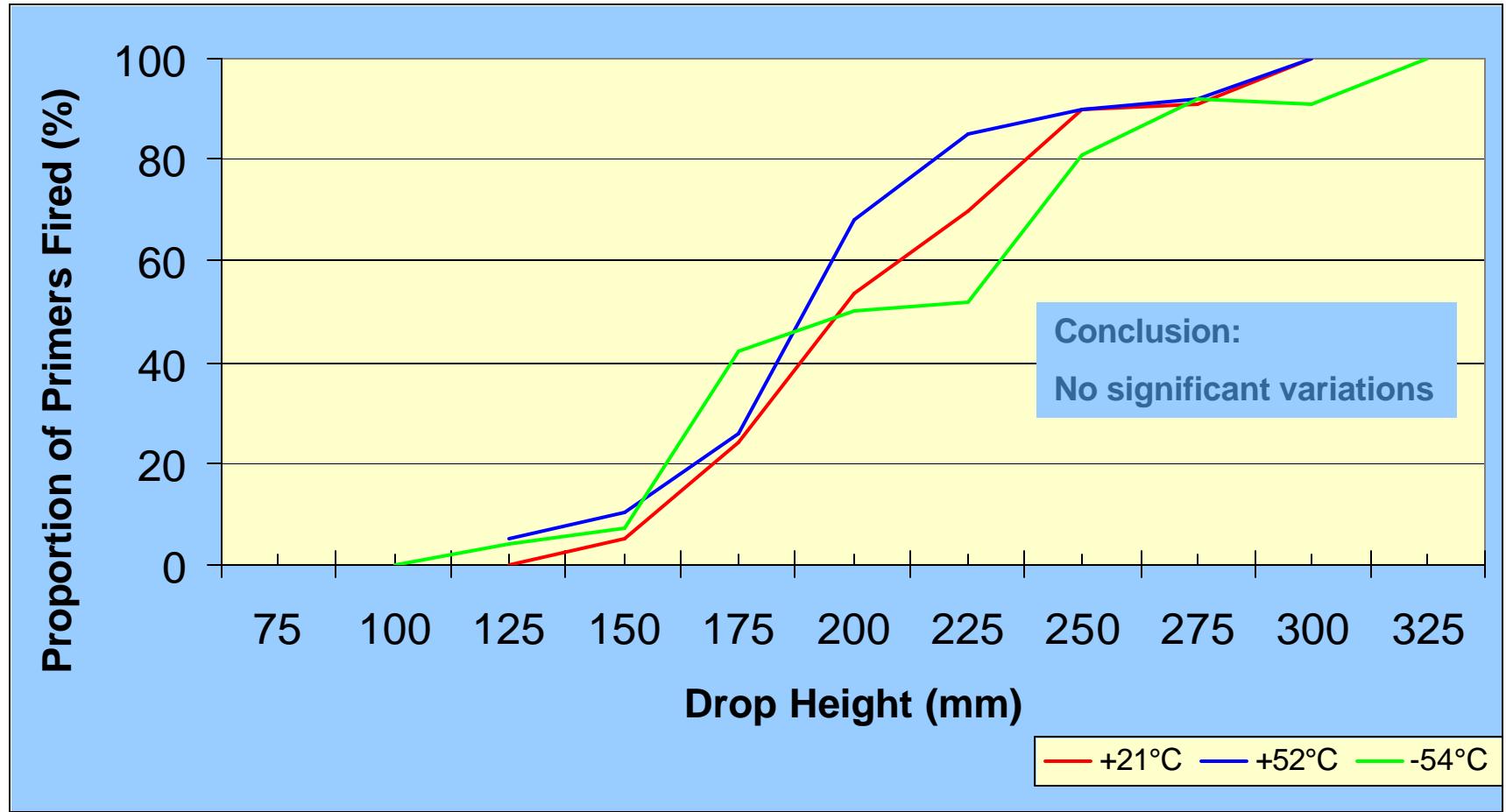


Fig. 5 - Ballistic Evaluation

Type	Case mouth	<u>Pressures (Mpa)</u>			Velocity (m/s) @ 24 meters	Action time (ms)
		Case mouth + 3s	Port - 3s			
Extrudable	333	355	96	909	0.92	
Extrudable	340	359	95	910	0.92	
Extrudable	335	342	94	919	0.98	
Wet loading process	324	344	95	902	0.97	
Wet loading process	321	335	93	904	0.98	
NATO SPEC	£ 380	£ 420	³ 88	910 ± 15	4.0	

Fig. 6 - Influence of ageing on sensitivity

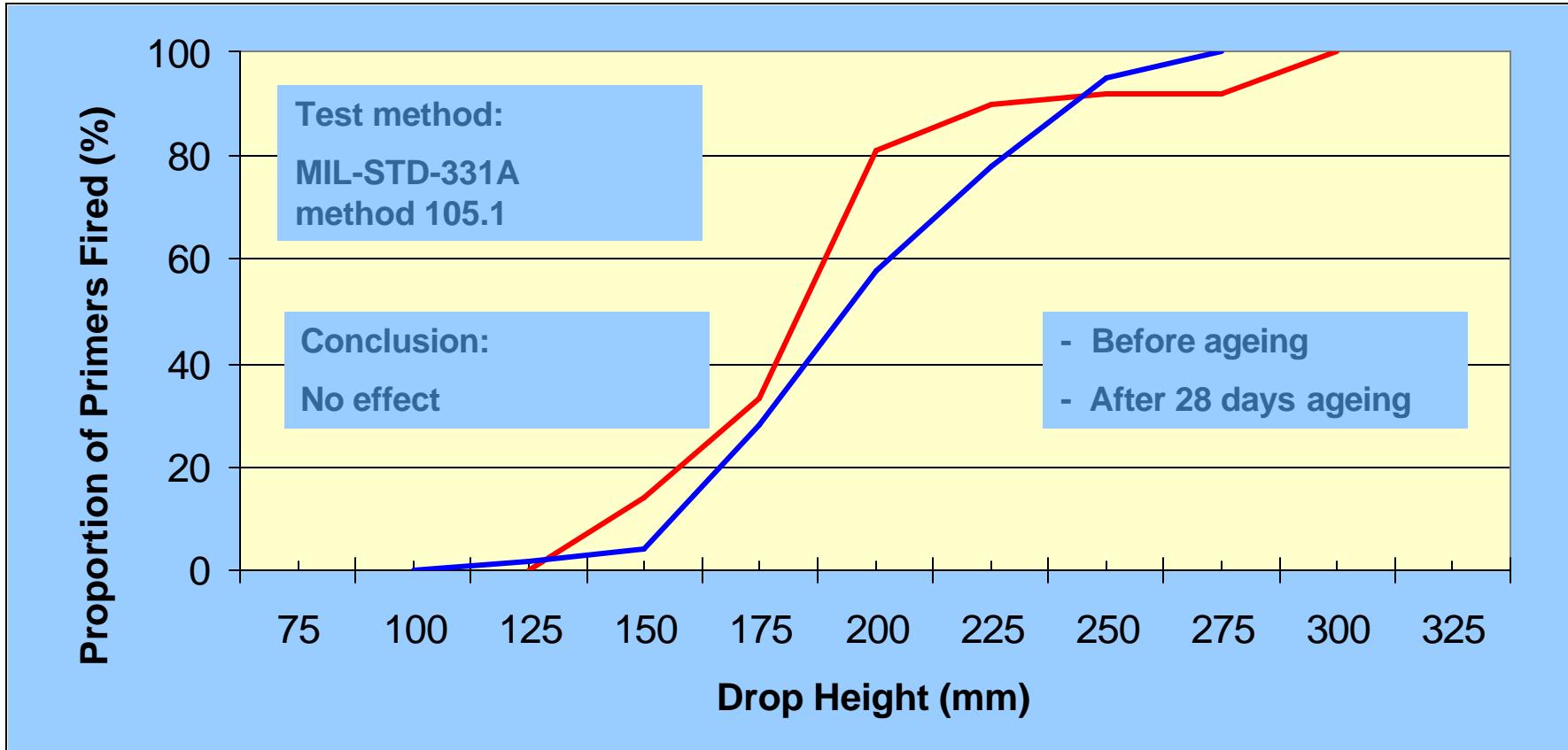
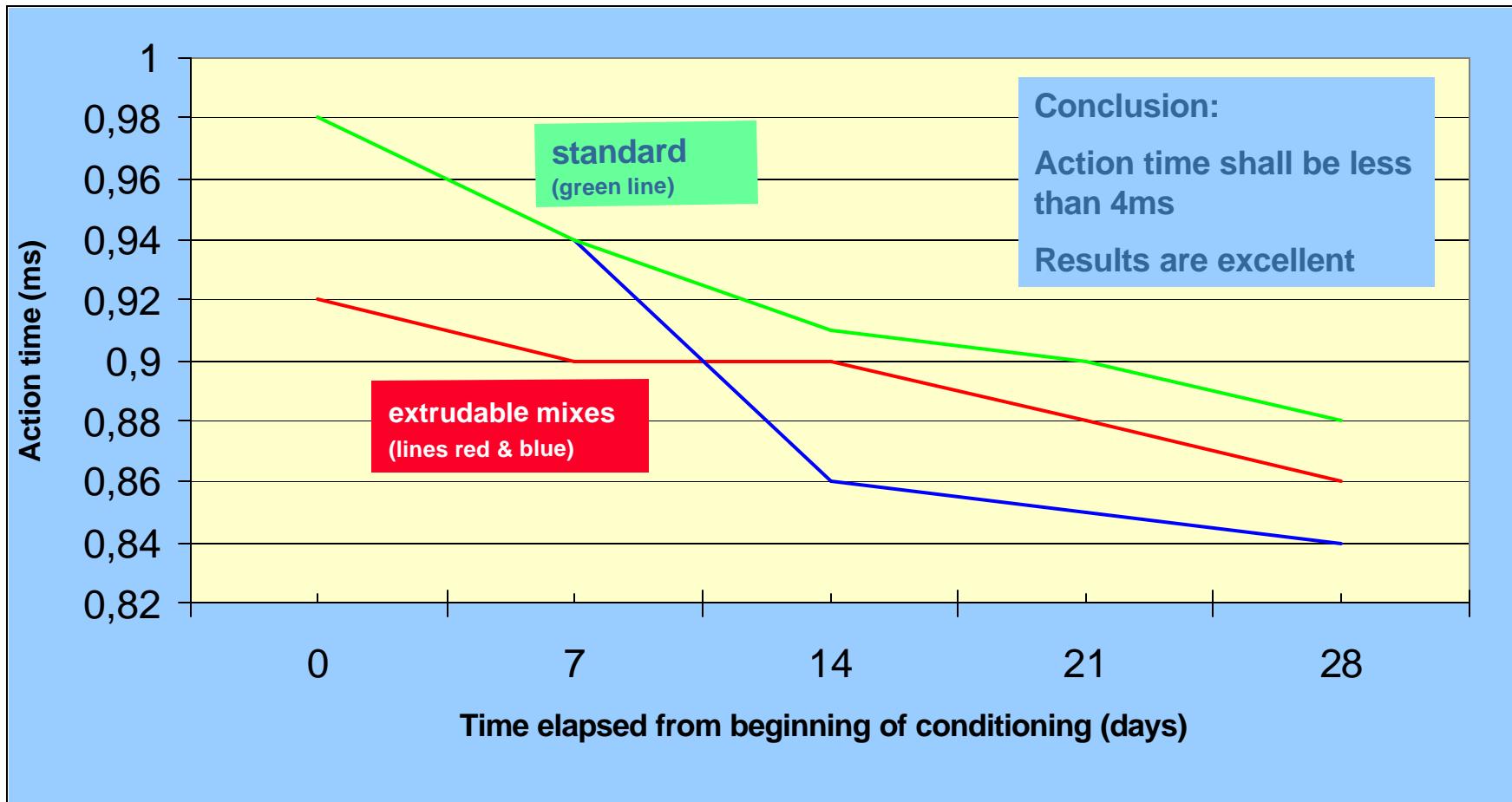


Fig. 7 - Influence of ageing on action time



CONCLUSION

- **Ballistic characteristics of "extruded primers" are equivalent to that of "plate loaded" primers**
- **Extrudability of priming compositions has been demonstrated**
- **The extrusion process could be automated**